People Organized in Defense of Earth and her Resources

Drainage Fees, Capital Improvements and Equity in the City of Austin

Report

Prepared by

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Executive summary:

Zoning and land use planning have been described by some scholars as not only as a root enabling cause of disproportionate burdens and environmental injustice, but also the most fundamental and potentially most powerful of the legal weapons deployed in the cause of racism. The history of land use planning and zoning in Austin helps to explain how the unequal distribution of environmental burdens has occurred, and why these historical patterns have been the source of many environmental justice problems that confront people of color or low-income communities in East Austin.

Residents in East Austin have endured major flooding in the past years. East Austin residents have witness the loss of lives, loss of property and/or property damage due to flooding in their neighborhoods.

Due to the recent flooding in East Austin, PODER began to look at issues of equity regarding the use of the City of Austin's Drainage Fee Funds for Capital Improvements Projects (CIPs).

On November 14th, 1991 the Austin City Council waived the rule requiring the reading of ordinance on three (3) separate days and adopted Ordinance Number 911121-D, municipal drainage utilities. With the adoption of the municipal drainage utilities the City created the Drainage Utility Fund, a separate fund for the purpose of identifying and controlling all drainage fee revenues.

This study analyzes the distribution of Capital Improvement Projects (CIPs) funded by municipal drainage fees. Drainage fees are assessed on most properties within city limits, and have recently undergone major structural changes. Particularly given recent major flooding events, many area residents East of Interstate 35 feel the city is inadequately funding CIPs in their neighborhoods, both in terms of their monetary contributions and need for drainage improvements.

Using data from the city and U.S. Census bureau, this study evaluates where drainage CIPs are located, how the city determines the need for improvements, how Austin neighborhoods contribute to the drainage budget, and the demographic and income characteristics of census tracts in Austin. Results show an extreme concentration of CIP spending in the downtown area. Outside of downtown, there appears to be a bias towards spending CIP funds in area parks, as opposed to residential or business areas.

Research into the city's methodology for determining the need for capital projects suggests there may be a need to include additional factors, such as cost, when weighting where to spend public funds. The city's current evaluation factors are highly correlated with dense land use downtown and issues resolved downstream in parks, rather than residential areas. In terms of financial equity, findings suggest that drainage fund contributors outside downtown areas, and particularly those in East Austin, are not seeing an equitable return on their investment.

PODER believes the following recommendations can be used by the City to address equity issues:

a) Reconsider the way it assesses need: the city should consider additional factors when assessing the need for a project. Every project has a utility cost – for every project the department does, there is another project or projects that it will not have the funds to do. Because the cost of projects does not currently enter into the city's decision making, doing few high "problem-score," extremely expensive projects is prioritized over doing a greater number of less expensive projects benefiting residential customers. In addition, the problem score approach benefits "bad behavior" from a drainage perspective: areas with a high degree of impervious cover do pay more, but since they cause more drainage issues, they are much more likely to see projects funded in their area.

b) Residents in areas like East Austin are assessed low problem scores, despite having many drain inlets and substandard streets that do not adequately or efficiently funnel storm water into the drain. Projects should be proposed to rehabilitate the roads, sidewalks, and inlets in East Austin and other low-income communities to reduce the amount of on street flooding and protect residential homes and small businesses from flooding in the case of a large storms. This would reflect the directives included in the WPD's budget, which states that "the purpose of the Drainage Pipeline Management activity is to ensure adequate conveyance of storm water flows through the storm drain pipeline system. Activities include the inspection, cleaning, installation and replacement of drainage pipelines and other associated concrete infrastructure."

c) Reconsider the way it assesses drainage fees: the city currently charges all residential customers based on a rate times the amount of impervious cover, and percent of impervious cover. A more realistic way to measure impact would be to conceive of impervious cover as a cost, and pervious cover as a credit – similar to the way residents with solar panels sell excess electricity to the power utility. Perhaps more importantly, the utility should base rates not only on the individual parcel's land use, but the land use of surrounding parcels. A high-density apartment complex, for example, may not cause flooding issues if proximate to a park, or if surrounded by lower density residential developments. When a high-density complex is proximate to other high-density complexes and business, however, drainage issues become extremely problematic. Furthermore, they are incredibly expensive to fix, an issue discussed in this report.

Introduction:

On November 14th, 1991 the Austin City Council waived the rule requiring the reading of ordinance on three (3) separate days and adopted Ordinance Number 911121-D. The adopted ordinance created the operation of a municipal drainage utilities. The City's Declaration of Purpose reads as follows: "After a public hearing on the matter, the City Council of the City of Austin hereby finds, determines and declares that in order to protect the citizenry from the loss of life and property caused by surface water overflows, surface water stagnation and pollution arising from nonpoint source run-off within the boundaries of the service area established herein, it is necessary and in the best interest of the public health and safety to establish a drainage utility, as authorized by state law." With the adoption of the municipal drainage utilities the City created the Drainage Utility Fund, a separate fund for the purpose of identifying and controlling all revenues and expenses attributable to the Drainage Utility. The City of Austin's Watershed Protection Department (WPD) is the entity responsible for flooding, erosion, and water quality mitigation.

Drainage fees are assessed on most properties in the City of Austin and have undergone significant revision recently, moving from a flat rate for residential customers to a billing formula based on lot size and the percent of impervious cover on the property. This change comes as the result of a court decision finding the city's previous methodology to be in violation of Texas Local Government Code, which states that drainage fees must be based on "(1) the developed use of the benefited property; (2) the amount that development increases runoff and associated pollutants; and (3) the amount of impervious cover of the benefited property."[1]

Though drainage funds are primarily used for the Watershed Protection Department's (WPD) operating expenses, around 30 percent is earmarked for CIPs. CIPs include city-wide improvements (such as upgrading department software, for example), but also localized projects that include reducing flooding and upgrading infrastructure at specific intersections.[2] To decide how to utilize these funds, the city employs a weighting methodology "scoring" drainage issues on four factors: creek flooding, local flooding, erosion control and water quality.[3]

Anecdotal evidence from city residents suggest that drainage CIPs tend to occur in higher income areas, though all city residents contribute to the WPD's budget. Residents in the Onion Creek area – the target of a multimillion dollar buyout program from the city and Federal government – also expressed a great degree of frustration over the speed of the buyouts. Below are highlighted quotes from PODER constituents:

> Well, if you look downtown and you look at some of the other areas that have money, that have been developed, they are able to mitigate the damages. I don't see any mitigation that has taken place to try to make our area livable, but rather to try to drive us out and to lower the price that they're going to offer us, is what I see. - Southeast Austin resident

> And if we're going to talk about applying the same policies to everyone, we need to talk about -- we have to have an additional conversation about some inequities in our community. And we need to talk about the inequity that exists that puts families in a position where they can only afford to live in one of the most dangers floodplains in our city - Councilmember Delia Garza
>
> I think three floods have been a lot. And so to me, I have to ask, how many floods do we have to go through? How many lives have to be lost? You know, you hear about the hundred-year floodplain. Onion Creek is not a hundred year, 25, it should be considered the two-year floodplain because that's how we feel - Anna Perez
>
> So I think it comes down to a matter of priorities. At least from my perspective. You have a public safety issue here and you have people living in a place that they ought not to be. If you look at where we build dams over the course of time, where we've done flood mitigation over the course of time, you'll see it's benefited certain geographic areas and yet the Onion Creek areas, the list of floods I've told you have flooded Onion Creek many times and you have not seen mitigation in that area, which affects a discreet group of people, which is east of I-35 or east of East Avenue and it's a concern because you have a group of people, many of them don't know English nearly as well as I do. -Luke Adams

Problem Statement/ Hypothesis

As a result of conversations with PODER constituents and study of relevant research, this paper looks into three research questions:

RQ1: Where are CIPs funded with drainage fees located?
H1: Few CIPs are located in East Austin relative to other areas, and are mostly found near recent developments.

RQ2: How do CIP locations compare to questions of equity, in terms of need and resident financial contributions?
H2: CIPs are inequitably distributed throughout the city, particularly in terms of resident financial contributions to the drainage budget.

RQ3: How do CIP locations compare to the demographic and income characteristics of residents?
H3: CIPs are concentrated in higher-income, non-minority areas.

Methods

Data:

CIP locations: Prior to beginning this project, PODER made an open records request to the City of Austin to obtain information about the location of current and planned CIPs. Since many CIPs are funded from various sources, it was necessary to obtain information in this manner to isolate drainage fee contributions from other funding streams.

A first step in sorting out this data was in categorizing CIPs. Roughly $12 of the $67 million (just under 18 percent) of CIP spending was directed towards system-wide improvements, such as GIS system upgrades, or Watershed Protection Department contributions to LIDAR imaging of the area. Since this type of project did not benefit one area of the city in particular (and most did not have an exact geographic location), these were excluded from analysis.

Remaining projects were categorized into one of three categories: active projects, floodplain and planning studies, and buyout programs/developer reimbursements. The rationale for breaking down the data in this way was to isolate projects that would have a short-term impact on drainage or watershed issues in particular areas (the active projects). These included projects to reroute drainage pipes, remove hydrilla from Town Lake, and upgrade storm drains.

Buyout programs, on the other hand, remove residents from a particular area (such as Onion Creek), largely because resolving drainage issues in that area would either be too expensive or have a detrimental impact on other areas of the city. As such, they do not provide a specific, localized drainage benefit to the residents living in that area. Floodplain and planning studies, while necessary for future projects, are also unlikely to result in short-term improvements in drainage in a specific area.

Locating all these projects was a time-consuming task. The full list of projects was manually transferred from a PDF to an Excel file. Certain projects had specific descriptions as to location (i.e. they referenced an intersection), while others were somewhat general, or obscure to those not intimately familiar with the city's drainage infrastructure (i.e. Old Lampassas Dam #3, or Boggy Creek Watershed Reach B8). Using the subproject ID code to locate project descriptions on the Watershed Protection Department's website, projects were located on Google Maps and assigned x and y coordinate locations in the Excel file. In the case of a large floodplain study or other projects occurring over a large area, an approximate midpoint was assigned. Single projects that occurred in multiple locations were broken up into an appropriate number of projects, with expenses evenly distributed over each project.

Lists of each type of project (active, buyout, and studies) are included in the appendix.

Demographic Information: As discussed in the introduction, East Austin is a rapidly changing area. As such, we did not want to rely on the 2010 Census, which is nearly six years old at the time of this writing. In order to obtain more recent and representative information, we decided to utilize the most recent American Community Survey (ACS) data from 2013. The downside to using this information was a loss of precision – since the survey is based on a random sample, many estimates have large margins of error at smaller geographies. We selected Census tracts as the unit of analysis, rather than Census blocks, which had such large margins of error as to be

unreliable. Extensive work was done in Excel to remove extraneous information and ensure variables were specified in the correct format for use in ArcGIS software.

City of Austin data: In addition to Census data on the area, this study utilized information on the floodplain, the amount of impervious cover, and the type of land use in the city, as these are highly important for questions of both the need for improvements and financial equity. In order to orient the study, we also wanted to include major roads in the city, county and city limit boundaries and major waterways. This information is available through the city's website.

Need and Equity: The WPD has become more transparent in terms of how it evaluates the need for drainage improvements, providing an interactive online map describing the metrics it uses to score need (See: http://austin.maps.arcgis.com/apps/MapJournal/index.html?appid=d45481abb0804c95a8e6b033188982b9). In the Watershed Protection Master Plan, the city also reports problem scores in each category.[4] This project considered how this methodology might impact the location of projects, and whether other methods could be more equitable.

Financial Equity: Highly detailed information on the geographic distribution of drainage fees is not publically available on the City of Austin's website. We were, however, able to find a percentage breakdown of how different types of property (single-family, apartment, and commercial) contribute to the overall budget under the current fee systems, along with estimates under the new fee schedule. Using information from the Watershed Departments memorandums on the new drainage charge (the "proposed method" shown in the above and below tables), we calculated that businesses will contribute about 37 percent of the total drainage budget.[5]

Table 3: Share of Total Drainage Charge by Land Use Type

Categories of Billable Parcels	Percent Share of Drainage Charge	
	Current Method: ERU	**Proposed Method:** Amount and % of Impervious Cover
Single Family	22%	29%
Multi-Family	27%	18%
Non-Residential (Green/Low Density)	4%	2%
Non-Residential (Commercial/Other)	47%	51%
Total Billable Parcels	100%	100%

Table 8: Non-Residential (Commercial/Other) Parcel Comparisons

Subcategories	# of Parcels	% of Parcels	Average Current Charge	Average Proposed Charge
Transportation/Aviation	500	4.5%	$645	$395
Commercial/Services	8,000	73%	$252	$288
Industrial	1,700	15.5%	$465	$490
Cultural/Educational	750	7%	$175	$128
Total	10,950	100%	$298	$313

To sum up, here are the estimates of percent contributions to the drainage fund under the new fee schedule:

- **Single family**: 29 percent
- **Multifamily:** 18 percent
- **Business:** 37 percent
- **Parks:** 2 percent
- **Other:** 14 percent

We then compared these estimates to the primary type of land use where projects were located, to see the extent to which spending matched contributions.

Findings

Map 1 (page 11): This map displays active, buyout and study projects throughout Travis County. Buyouts represent about 18% of total drainage-fee spending on CIP projects, and tend to be located in the South, and particularly Southeast (Onion Creek area) part of the city. Floodplain studies appear to be mostly West of Interstate 35, though they represent a small fraction of overall spending. Active projects represent the majority of spending at about 55 percent of all CIP spending.

Map 2-3 (page 12-13): Map two presents income and demographic data in Austin, compared to active project spending. While there does seem to be some correlation between higher-income areas and a greater number of large CIPs, it is somewhat difficult to see clear patterns.

To get a clearer picture of where spending is happening, Map 3 restricts active projects to just those over $250,000, which account for 85 percent of total spending on active projects. Tracts are represented in terms of the percent of active CIP spending that occurs in that tract. One downtown tract in particular receives 31 percent of all active CIP spending, while 71 percent of tracts receive no spending.

Maps 4-5(page 14-15): Map 4 displays the impervious cover throughout the city, along with the locations of all active projects. While it does seem that more spending may occur in areas with a high degree of impervious cover, the complexity of the map makes it somewhat challenging to see patterns. In addition, areas outside of downtown that appear to have a high degree of impervious cover, but no active projects. This becomes clear in Map 5, which shows the percent impervious cover of each Census Tract.

Map 6 (page 16): Map 6 presents the percent of each Tract that lies in the floodplain. Downtown tracts, which receive most of the spending, do have a high percentage of area on the floodplain. However, many outlying areas share the same characteristic, without having a major project occur in that area.

Map 7-11 (page 17-21): Map 7 shows the four types of land use examined in this study, in comparison to the location of CIP spending. Maps 8-11 break this down into a more digestible format by displaying the percent of land use (single, multi-family, business, parks) occurring in each tract. Findings seem to indicate that large projects are more associated with business downtown, and parks outside the downtown area.

Map 12 (page 22): Map 12 makes the previous point much easier to see, displaying spending per Tract, overlaid with parks and downtown business shape files.

Map 13 (page 23): Map 13 presents the results of hotspot analysis on CIP spending by tract. Results show hot spots in two downtown tracts, the tract that includes Zilker Park in Southwest Austin, one tract in East Austin that includes a large project on the Boggy Creek Greenbelt, and one project occurring near McKinney Falls State Park.

Conclusions and Recommendations

As the previous maps show, there seems to be a clear bias toward spending drainage fee funds in the downtown business area. Outside of downtown, most money seems to be spent in parks. From a "problem score" perspective, this makes some sense: most parks are located in greenbelts around urban creeks. Water quality problems, particularly when drainage problems are not resolved upstream, is obviously correlated to these areas, along with flooding and erosion. In downtown, the combination of a high degree of impervious cover and the percent of the area in the floodplain logically causes major flooding issues.

From an equity perspective, however, there are some major problems with how the city allocates public funds. For residential residents, and even business owners outside of downtown, it certainly does not seem fair to pay into a system that goes to address drainage issues distant from you, and rarely addresses local residential flooding concerns. This is particularly true for low-income and people of color, who are less likely to spend time downtown or use non-local parks.

To address these issues, the city could either:

a) Reconsider the way it assesses need: the city should consider additional factors when assessing the need for a project. Every project has a utility cost – for every project the department does, there is another project or projects that it will not have the funds to do. Because the cost of projects does not currently enter into the city's decision making, doing few high "problem-score," extremely expensive projects is prioritized over doing a greater number of less expensive projects benefiting residential customers. In addition, the problem score approach benefits "bad behavior" from a drainage perspective: areas with a high degree of impervious cover do pay more, but since they cause more drainage issues, they are much more likely to see projects funded in their area.

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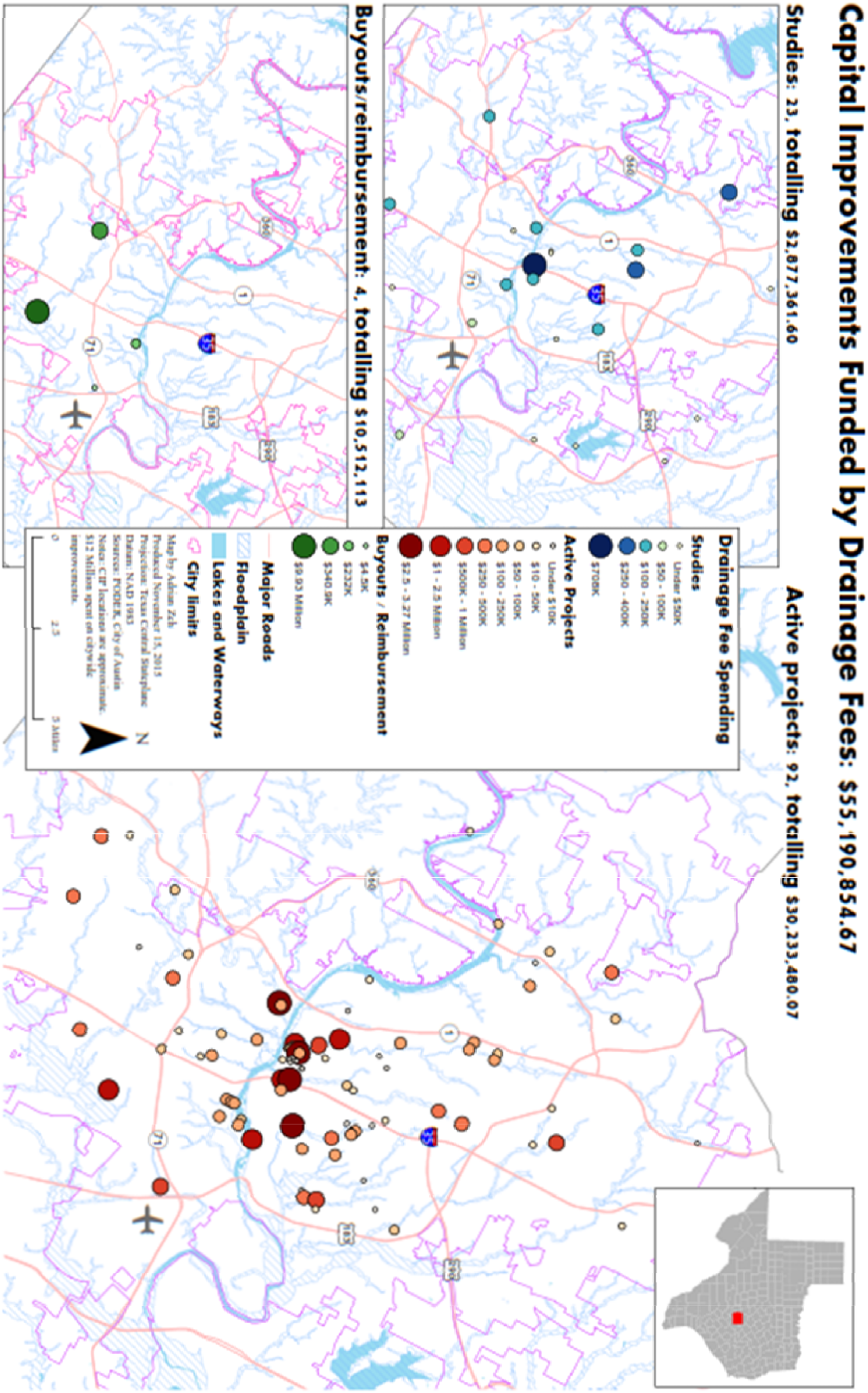
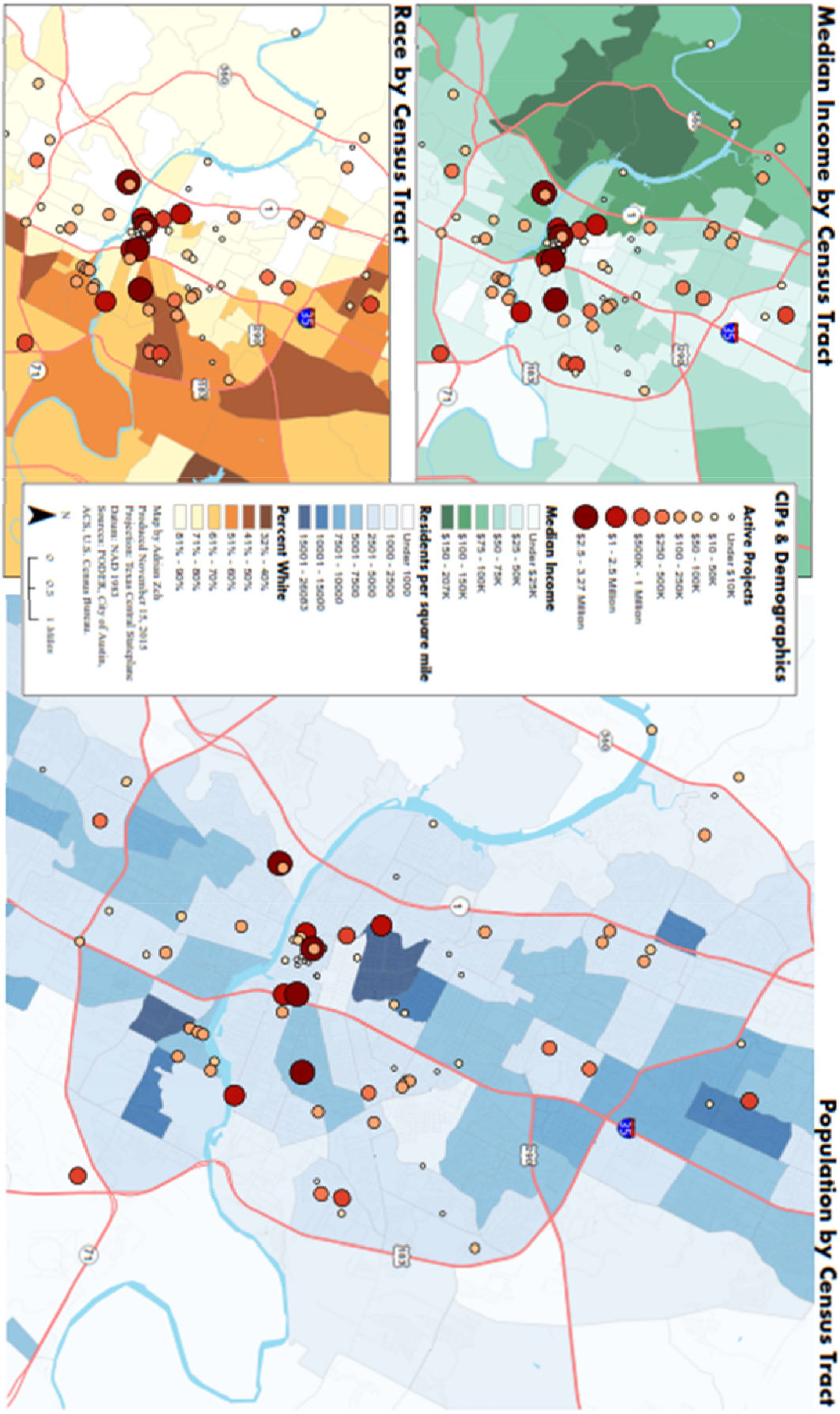
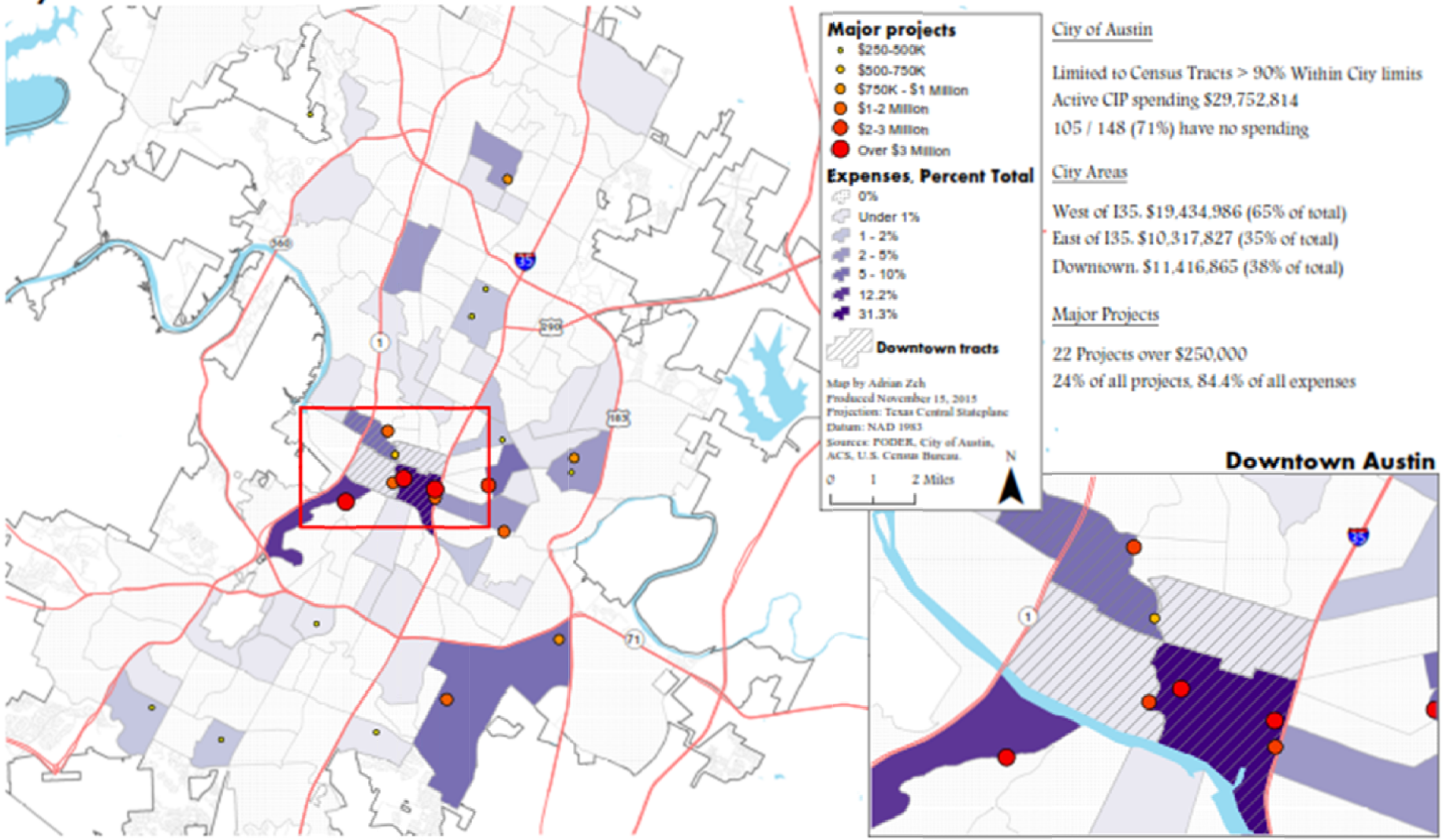

Capital Improvements Funded by Drainage Fees: $55,190,854.67
Studies: 23, totalling $2,877,361.60
Active projects: 92, totalling $30,233,480.07
Buyouts/reimbursement: 4, totalling $10,512,113
Drainage Fee Spending
Studies
Under $50K
$50 - 100K
$100 - 250K
$250 - 400K
$700K
Active Projects
Under $10K
$10 - 50K
$50 - 100K
$100 - 250K
$250 - 500K
$500K - 1 Million
$1 - 2.5 Million
$2.5 - 3.27 Million
Buyouts / Reimbursement
$4.5K
$232K
$340.8K
$9.93 Million
Major Roads
Floodplain
Lakes and Waterways
City limits
Map by Adrian Zeh
Produced November 15, 2015
Projection: Texas Central Statplane
Datum: NAD 1983
Sources: PODER, City of Austin
Notes: CIP locations are approximate.
$12 Million spent on citywide improvements.
0
2.5
5 Miles
N


Active Projects in Central Austin
Median Income by Census Tract
Race by Census Tract
Population by Census Tract
CIPs & Demographics
Active Projects
Under $10K
$10 - 50K
$50 - 100K
$100 - 250K
$250 - 500K
$500K - 1 Million
$1 - 2.5 Million
$2.5 - 3.27 Million
Median Income
Under $25K
$25 - 50K
$50 - 75K
$75 - 100K
$100 - 150K
$150 - 207K
Residents per square mile
Under 1000
1000 - 2500
2501 - 5000
5001 - 7500
7501 - 10000
10001 - 15000
15001 - 26083
Percent White
32% - 40%
41% - 50%
51% - 60%
61% - 70%
71% - 80%
81% - 88%
Map by Adrian Zeh
Produced November 15, 2015
Projection: Texas Central Statoplane
Datum: NAD 1983
Sources: PODER, City of Austin, ACS, U.S. Census Bureau.
N
0 0.5 1 Miles

Spending as a Percent of Total Expenditures

City of Austin Census Tracts



City of Austin

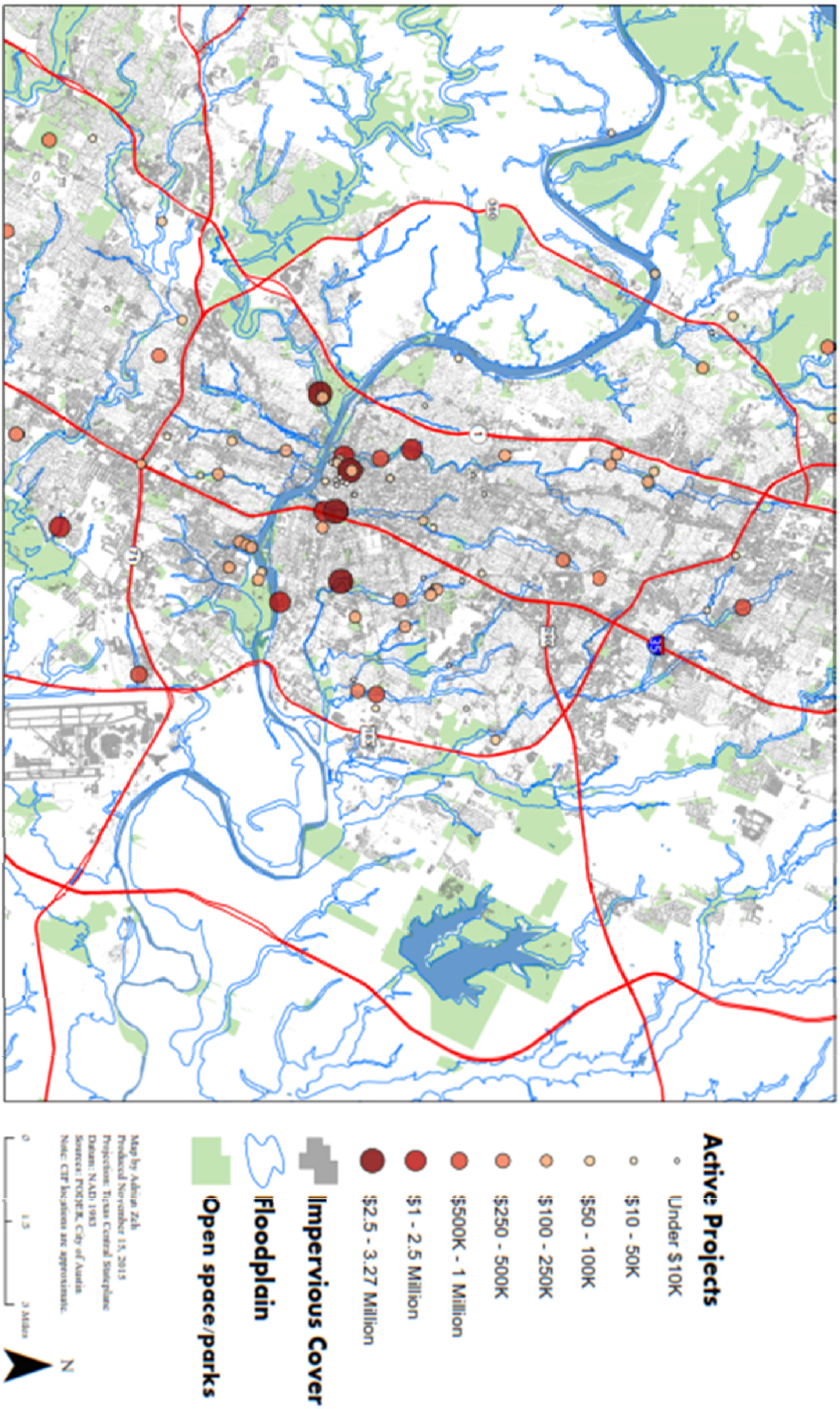
Limited to Census Tracts > 90% Within City limits
Active CIP spending $29,752,814
105 / 148 (71%) have no spending

City Areas

West of I35. $19,434,986 (65% of total)
East of I35. $10,317,827 (35% of total)
Downtown. $11,416,865 (38% of total)

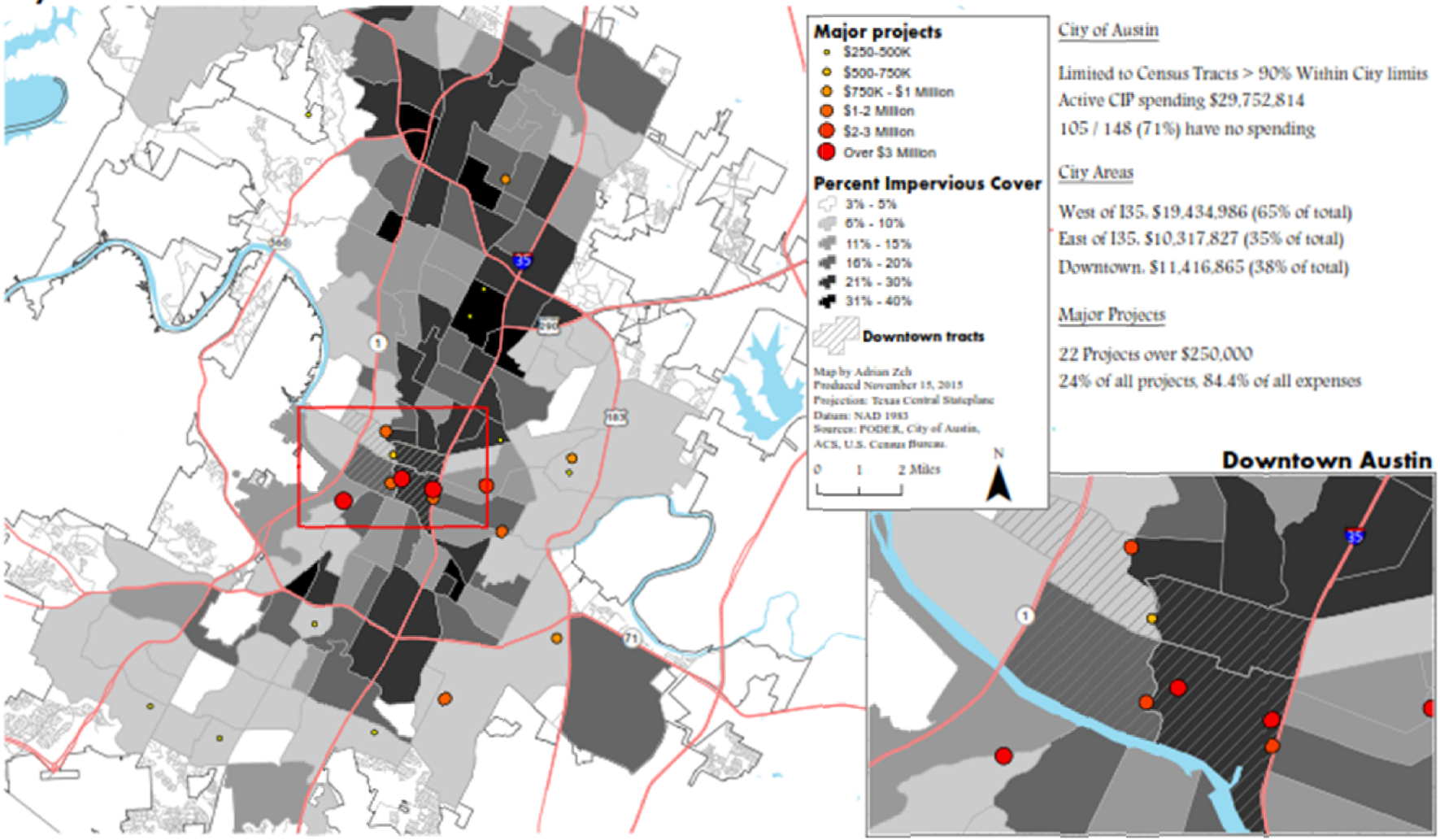
Major Projects

22 Projects over $250,000
24% of all projects, 84.4% of all expenses


Impervious Cover and Drainage Spending
Active Projects
Under $10K
$10 - 50K
$50 - 100K
$100 - 250K
$250 - 500K
$500K - 1 Million
$1 - 2.5 Million
$2.5 - 3.27 Million
Impervious Cover
Floodplain
Open space/parks
Map by Adnan Zeb
Produced November 15, 2015
Projection: Texas Central Statoplane
Datum: NAD 1983
Sources: PODER, City of Austin
Note: CIP locations are approximate.
0
1.5
3 Miles
N

Impervious Cover and Total Expenditures

City of Austin Census Tracts



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Floodplain and Total Expenditures

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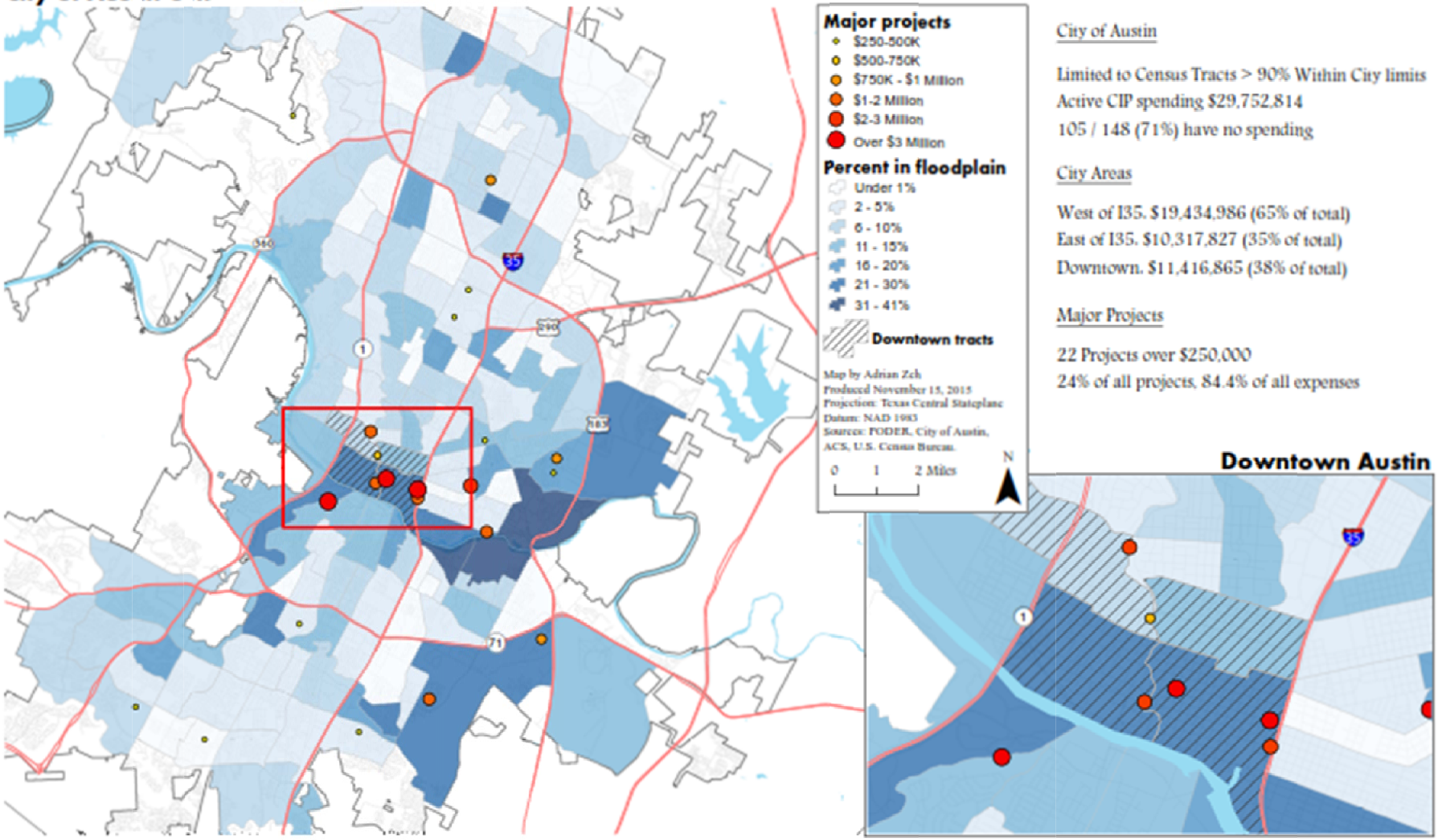

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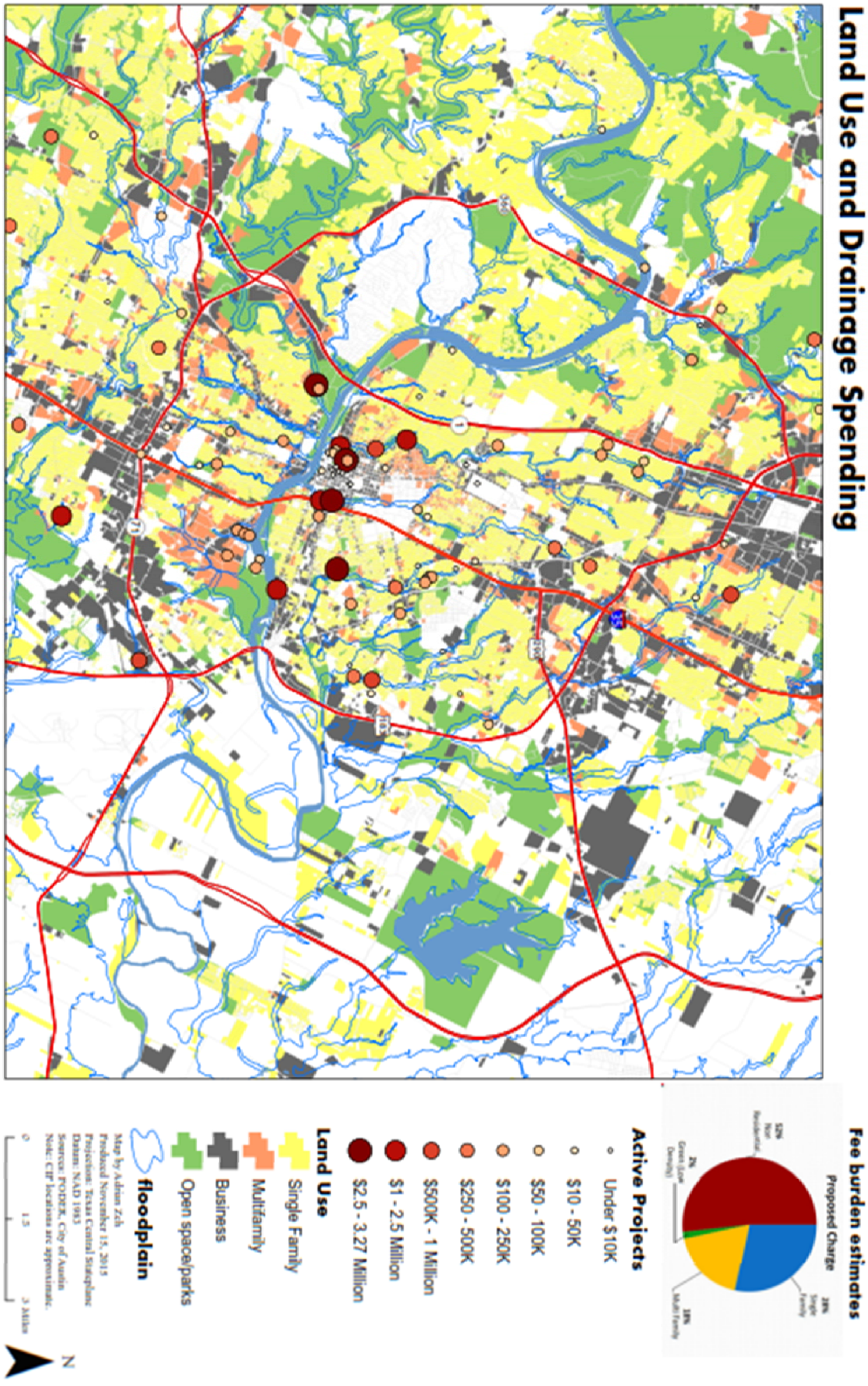
Land Use and Drainage Spending
Fee burden estimates
Proposed Charge
Active Projects
Under $10K
$10 - 50K
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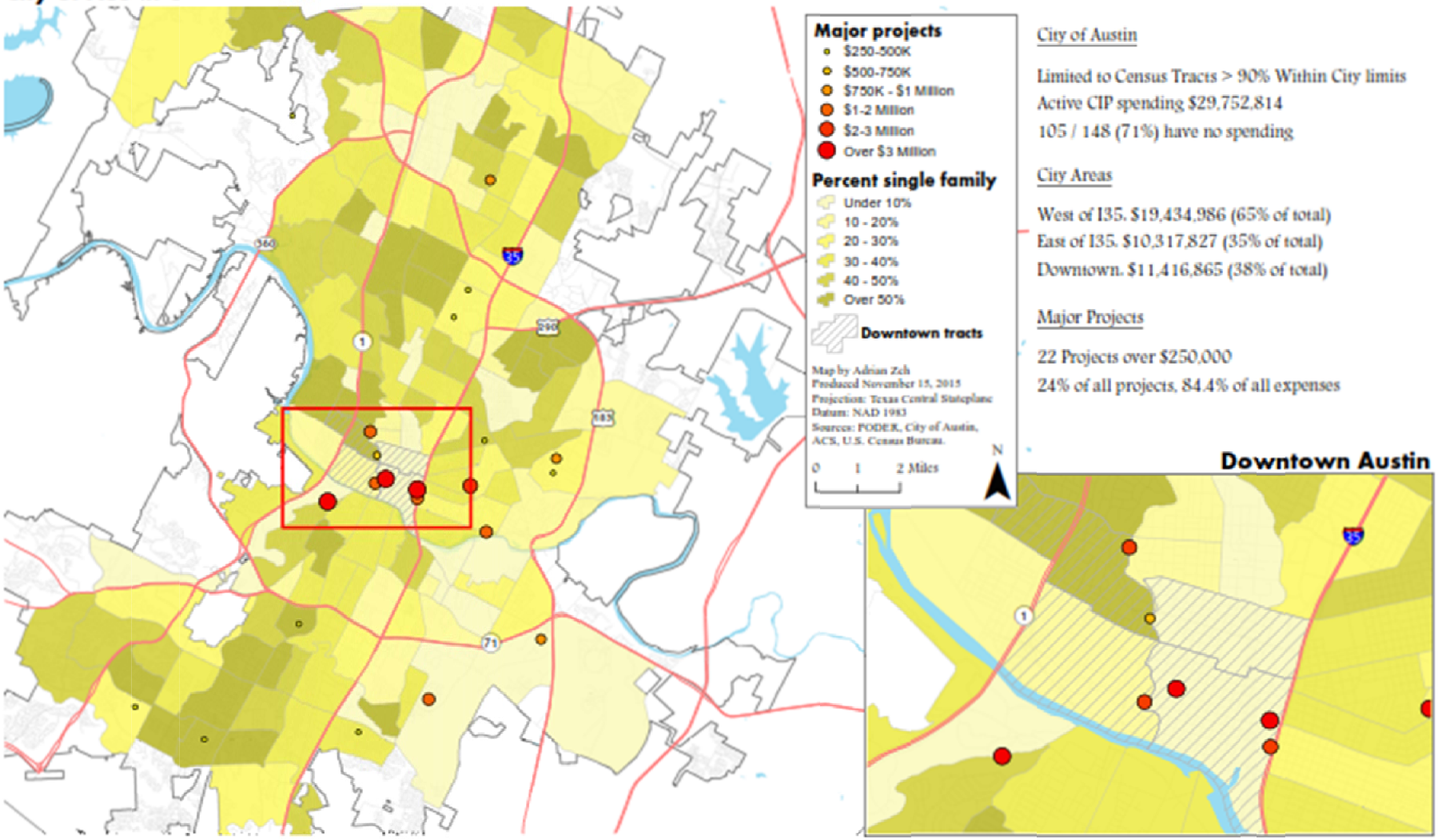
Land Use and Total Expenditures

City of Austin Census Tracts



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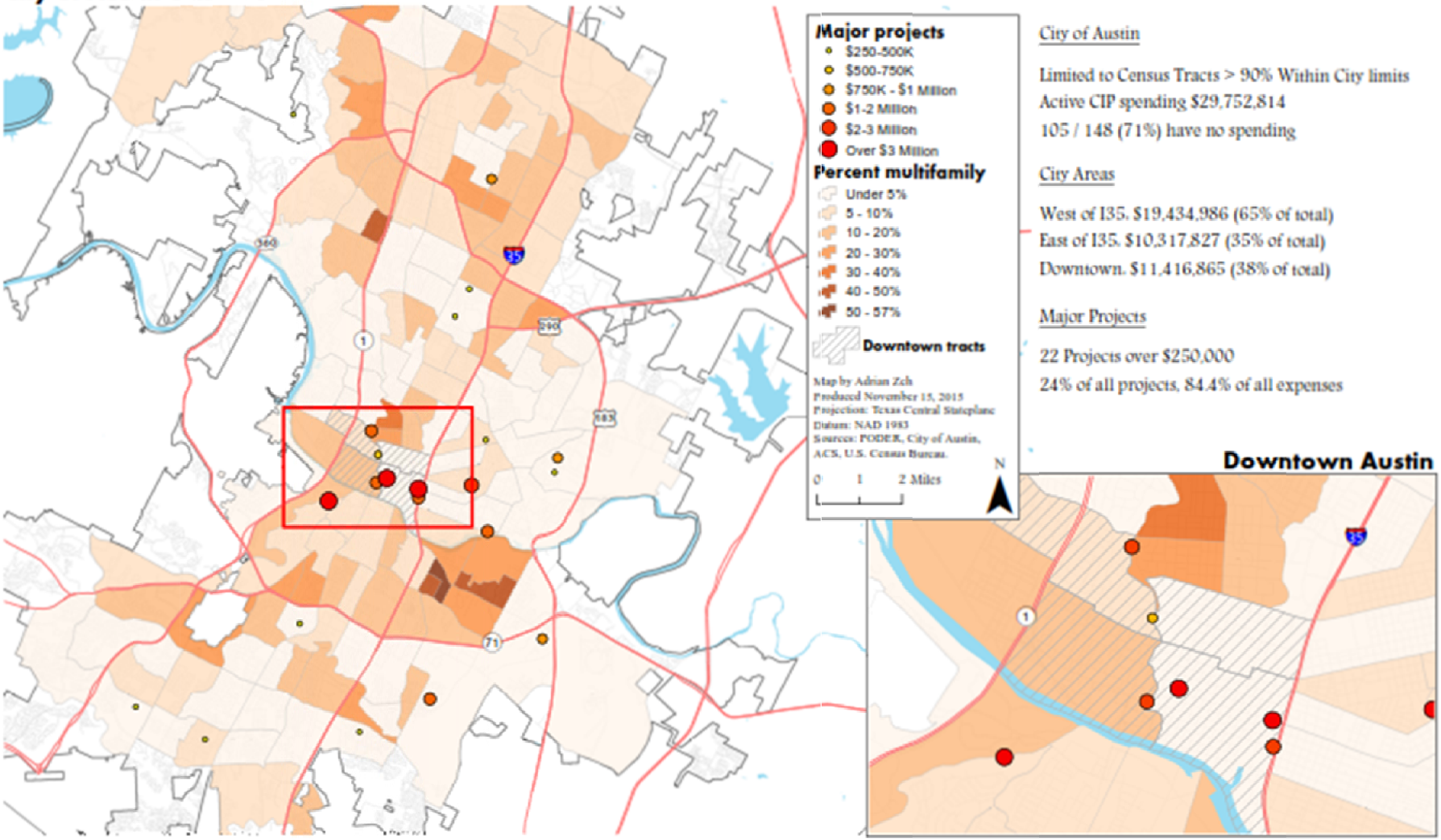

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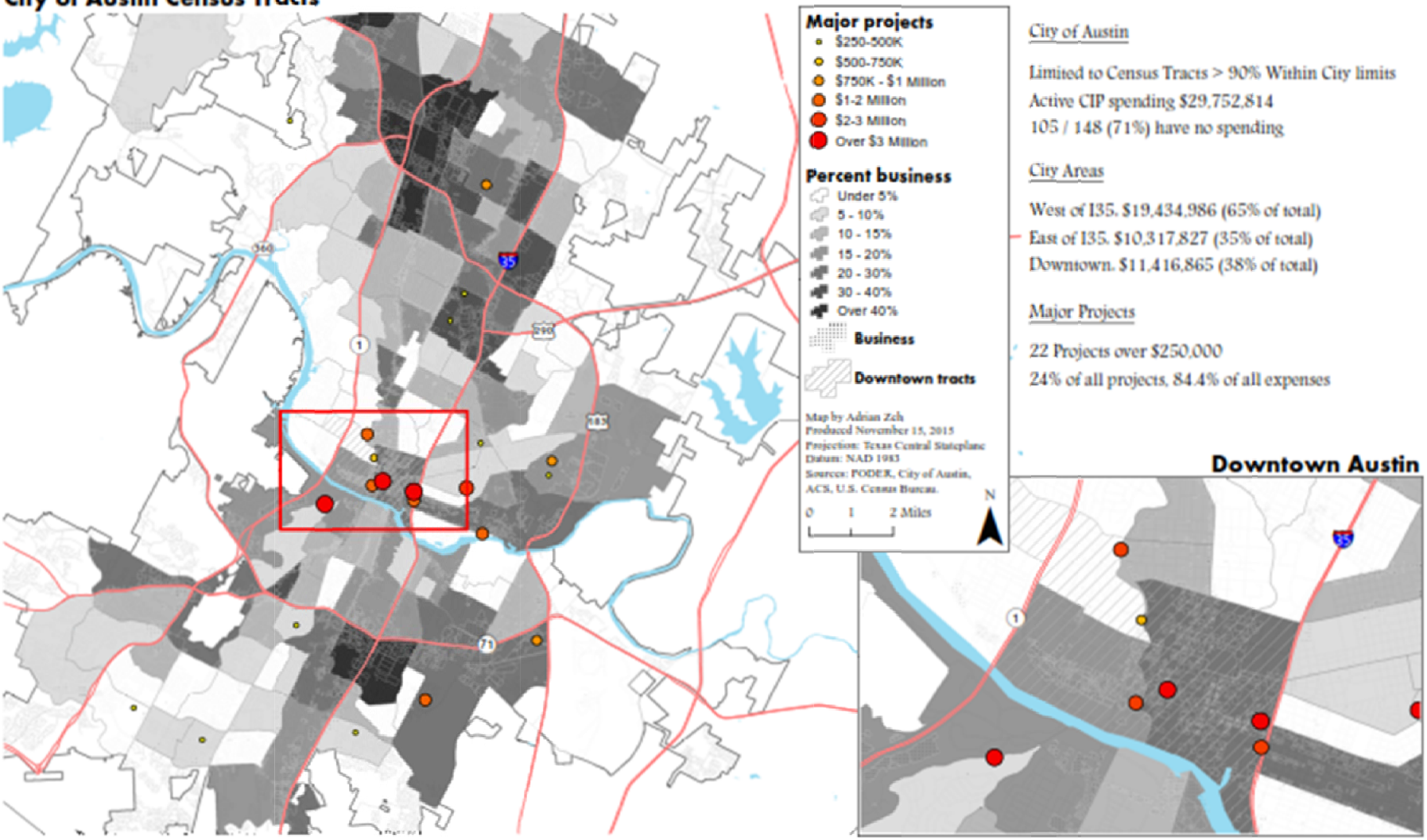

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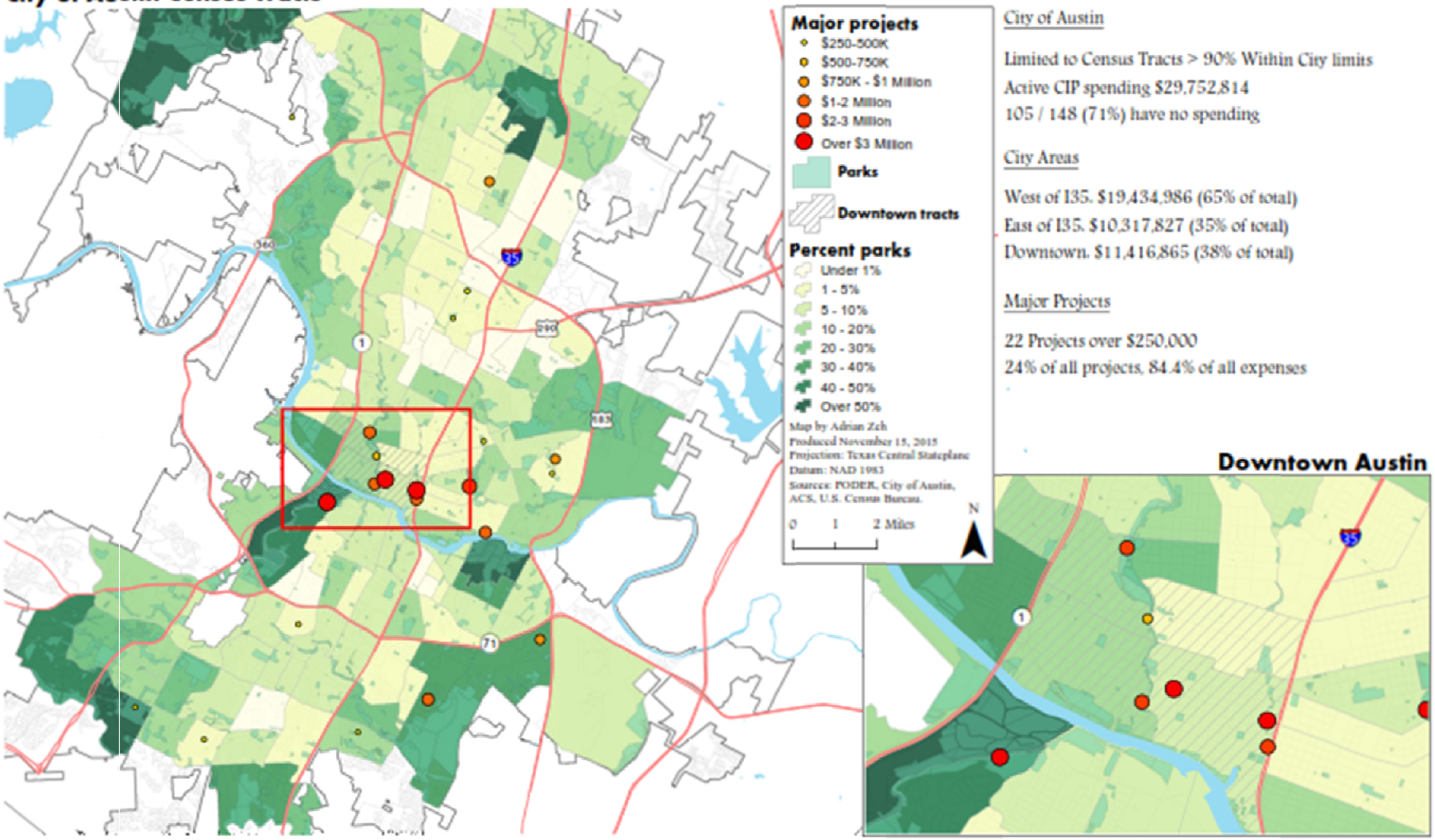
24% of all projects, 84.4% of all expenses

Land Use and Total Expenditures

City of Austin Census Tracts



City of Austin

Limited to Census Tracts > 90% Within City limits
Active CIP spending $29,752,814
105 / 148 (71%) have no spending

City Areas

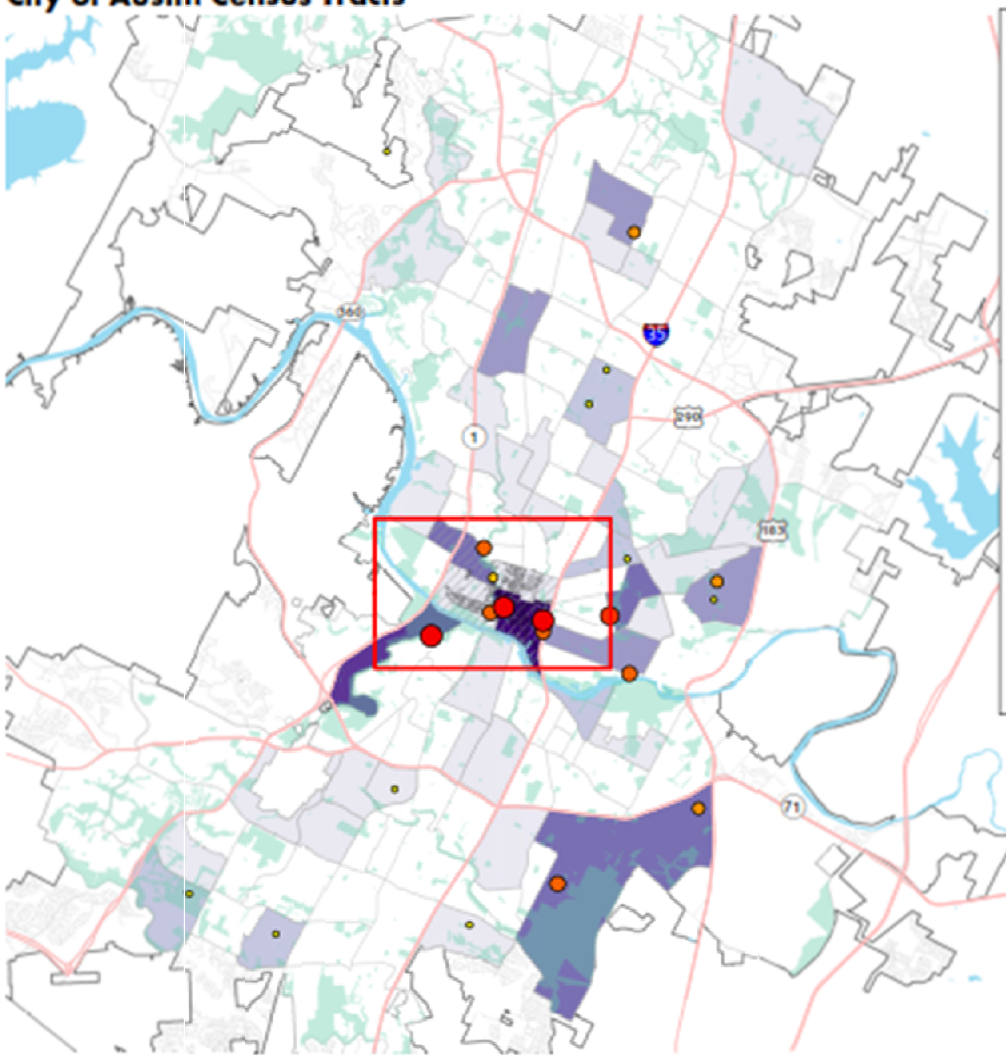
West of I35. $19,434,986 (65% of total)
East of I35. $10,317,827 (35% of total)
Downtown. $11,416,865 (38% of total)

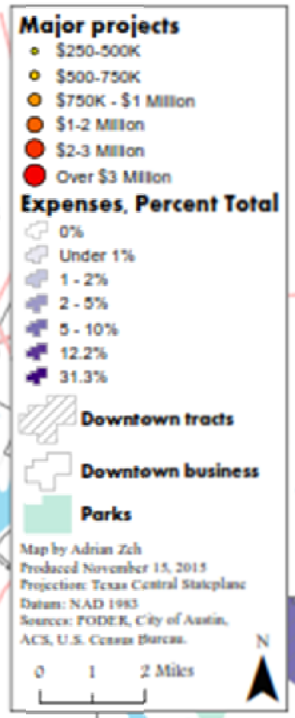
Major Projects

22 Projects over $250,000
24% of all projects, 84.4% of all expenses

Spending as a Percent of Total Expenditures

City of Austin Census Tracts





City of Austin

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East of I35. $10,317,827 (35% of total)
Downtown. $11,416,865 (38% of total)

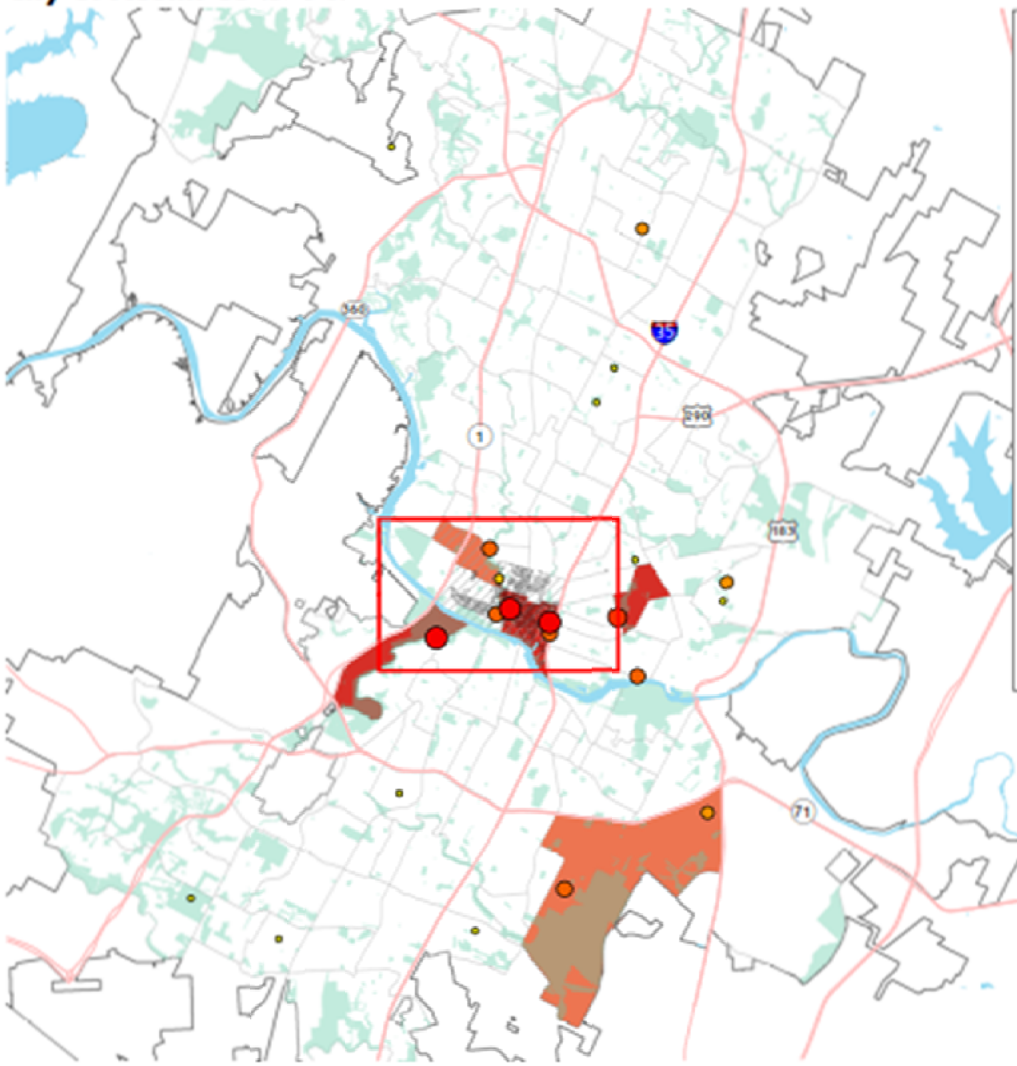
Major Projects

22 Projects over $250,000, total. $25,520,937.36
24% of all projects, 84.4% of all expenses
$14,309,327 (56.1%) spent near downtown + Zilker
$9,361,630 (36.68%) spent near other parks
$1,849,990 (7.2%) spent in other areas

Downtown Austin

Hot Spot Analysis: CIP spending by tract

City of Austin Census Tracts

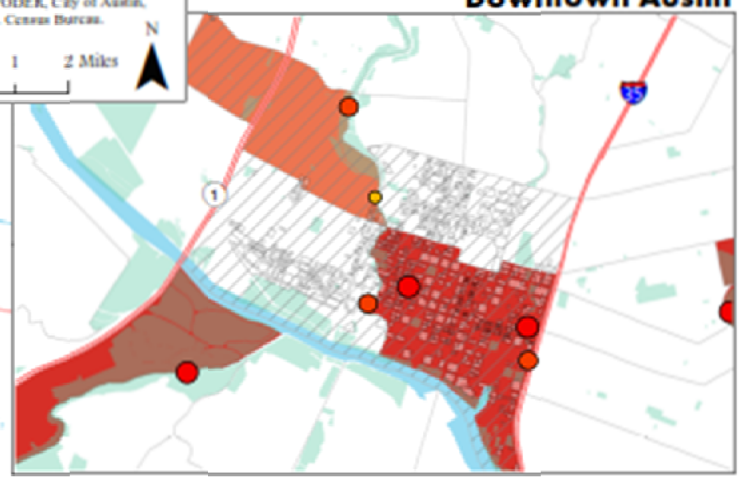


City of Austin

Limited to Census Tracts > 90% Within City limits
Active CIP spending $29,752,814
105 / 148 (71%) have no spending

Hot Spot Analysis

5 tracts exhibiting clustering of CIP expenses
3 in Downtown / Zilker park areas
1 in East Austin (Boggy Creek Greenbelt)
1 in Southeast Austin (Mckinney Falls State Park)
Tracts contain 10 Major Projects costing $20,246,143.60
10 projects - 67% of all active project spending



Appendix

Active Projects:

FID	SUBPROJECT	SUBPROJE_1	EXPENSES	Y_location	X_location
0	5754.026	Bull Creek-Lakewood Dr. Low Water Crossing Improvements	1164	30.366404	-97.78701
1	5754.084	Lake Austin River Hills Road Flood Improvements	23245	30.341413	-97.849863
2	5282.046	Williamson Maple Run BSZ WQ Retrofits	19594	30.205742	-97.849745
3	6660.035	Recharge Feature Maintenance Blowing Sink Preserve	365383	30.194324	-97.849651
4	6660.024	Little Bear Creek - Recharge Enhancement Facility	6240	30.131186	-97.838844
5	5282.034	Williamson Creek - Brodie Lane Water Quality Pond Retrofit Project	92281	30.223352	-97.82434
6	7492.006	Comburg Dam Modernization	407579	30.182698	-97.822505
7	6660.022	Austin Lakes Aquatic Plant Control & Restoration	54678.5	30.351966	-97.805228
8	941.001	Storm Sewer Improvements Group 1	747.6	30.208332	-97.798299
9	7492.029	Old Lampasas #3	336618	30.419072	-97.796477
10	5848.042	Williamson Creek - Pack Saddle Pass Tributary Rehabilitation	94343	30.228119	-97.794478
11	7492.015	BUL - Ridge Hollow Dam Pond id 235	58011	30.372142	-97.791937
12	5848.041	Williamson Creek - Richmond Tributary Rehabilitation	250620	30.221791	-97.783909
13	5789.054	Town Lake - Meredith St. Storm Drain Improvements	42342	30.300076	-97.781074
14	7492.012	BUL - Cougar Run Dam Pond ID 160 Modernization	174318	30.363904	-97.776393
15	6007.009	Barton Springs Pool WQ Retrofit	243737	30.263642	-97.771305
16	6007.01	Barton Springs Pool Bypass Tunnel &	327135	30.263	-

		Downstream Dam Repair & Rehabilitation	9	642	97.771305 -
17	6660.046	Eliza Spring Outlet Repair	114869	30.2643	97.770141 -
18	5789.097	Bull Creek - Charing Cross Storm Drain Improvements	53321	30.430475	97.767572 -
19	941.001	Storm Sewer Improvements Group 1	747.6	30.291006	97.766999 -
20	5848.062	Williamson Creek - Bitter Creek Tributary Channel Rehabilitation	289551	30.183946	97.761201 -
21	5282.03	Blunn Ck Warehouse Row WQ Pond	37678	30.223407	97.759483 -
22	5789.092	East Bouldin - Wilson Street Storm Drain Improvements	82070	30.240323	97.757578 -
23	5282.039	East Bouldin - OTC WQ retrofits	187446	30.254369	97.754451 -
24	5282.033	Shoal Creek Restoration - 15th to 28th Streets	1384698	30.287351	97.753826 -
25	5282.052	Lower Shoal Creek 5th to LBL Stream Restoration	1267576	30.269567	97.752278 -
26	5282.007	Williamson Creek IH 35 & Ben White WQ Ponds - Phase II	60395	30.216378	97.751404 -
27	5789.022	Shoal Creek - Ridgelea Storm Drain Improvements	134692.7	30.311661	97.751402 -
28	5789.087	Parkway Channel Improvement and Stream Stabilization	640941	30.279131	97.751283 -
29	6051.005	Shoal Creek Greenbelt - Trail Improvements / 4th Stre et Gap	59551	30.26841	97.75123 -
30	5789.061	Shoal Creek - Rickey Dr. Storm Drain Improvements	174074	30.341011	97.750893 -
31	7328.013	2nd Street Bridge and Extension / Shoal Creek to West Ave	33869	30.266565	97.750499 -
32	5282.053	Lower Shoal Creek District Stormwater Quality Retrofits	70901	30.26774	97.750362 -
33	5282.061	10th and Rio Grande Rain Gardens	20000	30.273677	97.748125
34	5789.096	Little Shoal Creek Tunnel Realignment and Utility Relocations - Phase I	3005589	30.271009	- 97.748

					033
35	5789.093	Little Shoal Creek Tunnel Stormdrain Improvements	153595	30.271475	-97.74791
36	5789.02	Shoal Creek - Allandale Storm Drain Improvements	234196.91	30.339155	-97.747843
37	6959.001	Group 30: Oltorf St E/Congress Ave-IH35	148351	30.236512	-97.747805
38	5789.019	Blunn Creek - Long Bow Storm Drain Improvements	24901	30.231908	-97.747432
39	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.268407	-97.745931
40	5408.002	West 34th Street from Shoal Creek Bridge to West Avenue Street Reconstructi	5455	30.303111	-97.745618
41	7492.007	SHL - Far West Dam, Pond id 267, Modernization	65787	30.350541	-97.745551
42	5282.085	18th and Rio Grande Rain Gardens	20000	30.281527	-97.745234
43	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.26718	-97.745207
44	6055.015	Second Street Phase 2, Colorado to Congress	15938	30.264518	-97.744918
45	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.269046	-97.744512
46	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.269986	-97.74416
47	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.267472	-97.743602
48	7492.032	SHL - Northwest Park ID 1454	123277	30.348917	-97.742445
49	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.271874	-97.740631
50	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.272061	-97.740561
51	10856.001	Central Market Wet Pond Maintenance	814	30.305965	-97.739931
52	2231.188	CBD Alley Water Lines 2010-Ph 1-4th to 10th & San Antonio	537	30.266962	-97.737012

53	6521.005	Waller Creek Tunnel - Tunnel & 4th St. Creek Side Inlet	1600000	30.264072	-97.735746
54	6521.001	Waller Creek Tunnel - Main	3139164	30.267108	-97.735723
55	5848.044	Williamson Creek Tributary 2 - Spring Meadow Road/Lark Drive Stream Rehab	1529305	30.194724	-97.733012
56	5848.066	Waller - Eastwoods Park Stream Restoration	80881	30.289901	-97.732293
57	7534.001	Street Reconstruction and Utility Adj. - 5th St. from I35 to Onion St	188097	30.263517	-97.730945
58	6686.001	Group 32- 32nd St. Reconstruct.& utility adjustment from Duval to Red River	25522	30.292422	-97.729963
59	5789.1	South Shore PUD Storm Drain Improvements	111783	30.241704	-97.727206
60	5790.1	South Shore PUD Storm Drain Improvements	111783	30.243595	-97.726079
61	5791.1	South Shore PUD Storm Drain Improvements	111783	30.244814	-97.725457
62	6039.105	CCW - Pleasant Valley \ Elmont Stormwater Conveyance Improvements	163536	30.238781	-97.71954
63	5754.085	Waller Creek - Reilly Pond Detention Performance Mod's	341864	30.32619	-97.719489
64	7492.001	LWA - South Metric Dam (Pond ID 581) Modernization	44438	30.371431	-97.719479
65	6660.022	Austin Lakes Aquatic Plant Control & Restoration	54678.5	30.247303	-97.718021
66	5789.101	46th Street / Airport Development Storm Drain Improvement	49700	30.304856	-97.715946
67	6660.032	Lady Bird Lake Invasive Riparian Management	148198	30.246368	-97.715662
68	5754.05	Boggy Creek - 38 1/2 Street to MLK channel improvements and culvert upgrade	7239	30.289568	-97.715017
69	5848.059	Boggy Creek Greenbelt - Reach B8 Stream Restoration	2862209	30.267944	-97.714525
70	6660.033	BOG - 3a Boggy at Crestwood	4963	30.29963	-97.713856
71	5282.04	Reznicek Field Water Quality Retrofit	252364	30.335	-

				492	97.713644
72	5848.058	Boggy Creek - Cherrywood Greenbelt Stream Restoration	38461.2	30.29217	97.712004
73	2231.128	Willowbrook at 40th Street. Water and Waste Water Improvements	193719	30.293087	97.711405
74	6660.052	BOG3B Riparian Restoration	13526	30.291508	97.711084
75	2231.128	Willowbrook at 40th Street. Water and Waste Water Improvements	193719	30.291303	97.709885
76	5848.063	Tillerty Street Storm Drain Outfall Stabilizing	1177024	30.251867	97.7087
77	8598.002	BOG - MLK TOD Stormdrain Improvements	325825	30.283461	97.70853
78	5754.086	Little Walnut Creek - Creek flood hazard reduction from Metric to Rutland	855163	30.372976	97.703839
79	6660.059	BOG - 1a Oak Springs Riparian Restoration	244440	30.271446	97.703702
80	7492.005	LWA - Mearns Meadow Dam - Pond ID 026 - Moderniz ation	17789	30.363559	97.703256
81	6039.006	Walnut Creek - Upper Walnut Creek Regional Detention Facility (Pond G)	1873.5	30.429233	97.70221
82	5282.055	J. J. Seabrook Stream Restoration, Rain Garden and Urban Trail Project	102244	30.284482	97.700447
83	5848.055	Fort Branch Creek - Manor Rd to Confluence West Trib	5647	30.295729	97.688416
84	5754.048	Hoeke-Posten Lane Roadway and Drainage Improvements	887350	30.21456	97.687926
85	941.001	Storm Sewer Improvements Group 1	747.6	30.270745	97.684865
86	5848.067	Lott Avenue Site Improvements	401099	30.271689	97.681449
87	5848.057	Fort Branch Creek Reach 6&7 Channel Rehabilitation - Truelight and Eleanor	929656.36	30.276556	97.680206
88	5789.099	Fort Branch - Tannehill Lane @ Jackie Robinson Street	27984	30.276227	97.676006
89	941.001	Storm Sewer Improvements Group 1	747.6	30.300042	-97.675

90	5789.09	Ashland Circle Storm Drain Improvements	88214	30.307444	-97.665252
91	7492.013	WAL-Tech Ridge Dam - Dell Wet Pond ID 726 - Modernization	43903	30.398281	-97.664859

Buyout Programs

FID	SUBPROJECT	SUBPROJE_1	EXPENSES	Y_location	X_location
0	5781.006	Bayton Loop / Burrough Cove Buyout's	340906	30.220987	-97.807797
1	5754.052	Onion Creek Flood Hazard Mitigation, Ecosystem Restoration, & Recreation	9934731	30.178338	-97.746812
2	5781.005	Carson Creek - Creek Flood Buyout Program	4503	30.215354	-97.687666
3	6021.004	Developer Reimbursements for Appendix T for Lakeshore PUD	231973	30.244095	-97.723073

Floodplain/Planning Studies

FID	SUBPROJECT	SUBPROJE_1	EXPENSES	Y_location	X_location
0	6938.005	Dry Creek East - Floodplain Study and Mapping	51596	30.16854	-97.59583
1	5754.046	Gaines Tributary of Barton Creek - Flood Hazard Assessment	103165	30.235295	-97.852123
2	6938.011	Bull Creek - West Bull FPS	303870	30.393622	-97.789641
3	6039.099	Slaughter and South Boggy Creek Erosion Hazard Zone Mapping	106428	30.16772	-97.786975
4	6660.027	Barton Springs Zone Spill Plan and Dye Studies	76620	30.264688	-97.765973
5	6660.03	Habitat Conservation Plan	139081	30.264688	-97.765973
6	5282.008	West Bouldin Creek Integrated Water Quality Project	28112	30.249656	-97.764333
7	5771.06	Bike Blvd. Rio Grande and Nueces from 3rd to MLK	4868	30.274621	-97.747801
8	6938.007	Shoal Creek Floodplain Study	193049	30.331929	-97.747023

9	5772.06	Bike Blvd. Rio Grande and Nueces from 3rd to MLK	4868	30.274315	-97.746728
10	9083.002	Waller Creek District - Park, Trail, and Tunnel Coordination and Planning	708433	30.263023	-97.737423
11	5282.09	Impact of Decentralized Green Stormwater Controls	393014	30.330453	-97.731829
12	8598.004	LBL - Plaza Saltillo TOD Stormwater Management Assessment	149921	30.262063	-97.727018
13	6021.004	Developer Reimbursements for Appendix T for Lakeshore PUD	231973	30.244095	-97.723073
14	941.001	Storm Sewer Improvements Group 1	747.6	30.419683	-97.714956
15	6938.008	Cottonmouth Floodplain Study And Mapping	34630	30.164601	-97.714611
16	6938.012	Carson Creek FPS	83279	30.220748	-97.69446
17	6938.01	Boggy Creek - Tannehill/Fort FPS	217440	30.304413	-97.687103
18	5848.061	Lower Ft. Branch - Flood and Erosion Voluntary Buyout Program	18922	30.276476	-97.68028
19	6039.097	Eastern Watersheds Erosion Study	6836.25	30.368874	-97.616887
20	6039.097	Eastern Watersheds Erosion Study	6836.25	30.260045	-97.603689
21	6039.097	Eastern Watersheds Erosion Study	6836.25	30.287728	-97.598075
22	6039.097	Eastern Watersheds Erosion Study	6836.25	30.354156	-97.579483

References

[1] Code of Ordinances of the City of Austin §15. "Utility Regulations." City of Austin. https://www.municode.com/library/tx/austin/codes/code_of_ordinances?nodeId=TIT15UTRE [Retrieved October 9, 2015].

[2] Watershed Protection Department. (2015). "Memo to Mayor and City Council: April 30, 2015" City of Austin. https://www.austintexas.gov/sites/default/files/files/Watershed/ordinances/Drainage_Charge_Memo_4_30_15.pdf [Retrieved October 9, 2015].

[3] Watershed Protection Department. (2015). "Master Plan Problem Score Viewer." City of Austin. http://austin.maps.arcgis.com/apps/MapJournal/index.html?appid=d45481abb0804c95a8e6b033188982b9 [Retrieved October 9, 2015].

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